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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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October 16, 2003

John E. Klanke
APT, Limited
6910 North Main Street
Granger, Indiana 46530

Re: Remediation Work Plan Review
CTS Corp. – Electromechanical Division, Plastics Plant
900 West Boulevard North
Elkhart, Indiana
VRP #: 6020501

Dear Mr. Klanke:

This office has completed review of the Remediation Work Plan received August 12, 2003 for the CTS Corp. Electromechanical Division, Plastics Plant facility in Elkhart, Indiana. The extent of soil and groundwater contamination at and around this site remains undetermined. Additional horizontal and vertical investigation is required in subsurface soils and groundwater. Contamination was first discovered at the site well over a decade ago and analytical results show significant exceedances of off-site cleanup objectives near site boundaries. Because of the transmissive nature of site soils, the possibility that contamination extends off-site must be thoroughly investigated. Until the extent of the contamination has been determined, evaluation of remedial approaches is premature and the Remediation Work Plan cannot be approved. Specific comments appear below.

1. Page 2, bullets 5 and 6: Note that the RISC Technical Guide defines surface soils as those within zero to six inches of the ground surface.

2. Page 2, last bullet: This bullet states that "Only the uppermost 25-30 feet of the aquifer unit . . . is impacted by constituents of concern above default RISC Industrial closure criteria." Note that groundwater contamination must be delineated out to default RISC residential closure criteria. See comments 8 & 11 below for additional comment on vertical delineation of contamination.

3. Page 3, paragraph 4: The statement that "...there are no impacted soils at off-site locations." is (as yet) unsupported by data. Soils collected at GB-39, just inside the property boundary, exceed residential cleanup goals. Figure 10 shows that the source area has not been defined in several directions.

4. Page 3, last paragraph: The statement that "Any off-site groundwater impacts will be addressed via natural attenuation." is unacceptable. Off-site groundwater impacts have not even been investigated. Nor is it clear how attenuation of any such impacts could be verified without emplacement of a monitoring well network designed to monitor said impacts.

5. Page 3, last paragraph: Note that off-site impacts must be below residential cleanup goals, and that use of non-residential cleanup goals, either on or off-site, will require land use restrictions imposed through an Environmental Restrictive Covenant (ERC) recorded onto the affected property deeds. A draft ERC must be approved by IDEM before it is signed and recorded. A boilerplate ERC is attached for review.

6. Page 16, second full paragraph: While it is clear that remedial action is justified for on-site soils, the statement that "There are no off-site soil impacts associated with the CTS site." is (as yet) unsupported by data. The extent of the source area remains undetermined and no off-site investigation of soils has occurred. Discussion of remedial designs is premature until the extent of contamination has been determined.

7. Page 16, third full paragraph: Reference is again made in this paragraph to allowing off-site contamination to naturally attenuate. For the reasons noted in comment 4 above, this is unacceptable.

8. Page 21, paragraph 5: The site geology was inadequately investigated. In 14 years of investigation, the deepest boring was to a depth of 52 below the surface, though bedrock "is believed to occur approximately 140 feet below the ground surface." The primary contaminant of concern is TCE. It is a standard requirement to determine the vertical extent of contamination. When a potential DNAPL is suspected, it is critical to determine the depth of the bottom of the aquifer and to sample for chlorinated hydrocarbons at the bottom of the aquifer. This has not been done. The investigation into the vertical extent of contamination is inadequate. The aquifer has not been adequately described.

9. Page 22, paragraph 1: "Ground water flow is consistently toward the southeast..." High concentrations of dissolved TCE contamination in the ground water have been consistently encountered in MW-5, down-gradient from the container storage area (CSA) and building 104. There are no monitoring wells or soil boring locations further southeast (down-gradient) of this location. The extent of contamination down-gradient of MW-5 has not been delineated. Further, vinyl chloride concentrations in MW-6 and MW-8I, both located along the southern (downgradient) edge of the site, exceed both industrial and residential cleanup goals. These data show that the extent of contamination has not been determined to the south or southeast of the site.

10. Page 24, paragraph 1: "For purposes of this discussion, only the January 2003 data is considered, the remaining data being obsolete." Staff agree that the data from the early 1990s do not represent the current extent of contamination or the distribution of

contaminant concentrations in the soil or ground water. However, the monitoring well network has never adequately delineated the extent of contamination. It is probable that the high levels of contamination simply decreased by 2 orders of magnitude due to migration, not attenuation. The existing monitoring well network is not properly located to allow for an accurate assessment of ground water quality.

11. Page 25, paragraph 3: The potential for the presence of TCE as a free phase DNAPL is discussed. APT concluded that 10% of the aqueous solubility should be present to indicate DNAPL presence. APT cites the maximum concentration as 2,300 parts per billion (ppb) and calculated that this is 0.05% of the solubility, therefore no DNAPL is present. Staff disagree. APT reports on Table 2, Ground Water Analytical Results, that in August 1991, MW-5 had a detection of 9,947 ppb in MW-5. The detection of 2,300 ppb TCE was also from MW-5, from the ground water sample taken in June 2003. Three samples from the period of January 1990 to March 1993 had results ranging from 3,433 to 9,947 ppb TCE in MW-5. In 14 years of investigation, no monitoring wells have been installed down-gradient relative to MW-5. Due to the incomplete delineation of ground water contamination and the 14 year time span, contaminant migration has probably occurred without being discovered. Dismissal of historical data does not accurately lead to a site characterization. Also, the downward migration of DNAPL is not a simple vertical line. DNAPL is known to move horizontally, even in the vadose zone. Staff also disagrees with APT's benchmark of 10% of solubility to indicate DNAPL. Pankow and Cherry (1995, Dense Chlorinated Solvents and other DNAPLs in Groundwater, p. 222) state that "As a 'rule-of-thumb,' the finding of dissolved concentrations that **exceed 1% of the effective solubility** should probably be cause for serious consideration of the presence of a DNAPL phase in the subsurface." The historical high detection of 9,947 ppb TCE was approximately 0.7% of the solubility of TCE at 20°C, as listed in Table A2 from Pankow and Cherry. Considering the non-ideal monitoring well placement and the approximation of the 1% solubility, the site needs to be investigated for DNAPL in the vicinity of MW-5. Monitoring wells need to be installed to the depth of bedrock or the bottom limiting layer of the aquifer. Sufficient monitoring wells need to be placed to delineate the area, because a minimum of 14 years of migration has occurred.

12. Page 26, Section 2.3.3: The statement that "...the extent of soil impact is restricted to the plastics facility...".is not supported by off-site sampling data.

13. Page 28, Section 2.6: This section states that "...additional off-site investigation does not appear to be feasible due to access limitations associated with adjacent properties." Please elaborate. Have adjacent property owners been informed that their property may be contaminated? Have they explicitly refused to permit sampling? If so, please attach documentation demonstrating this.

14. Page 40, last paragraph: Similar concerns apply to this text as apply to that quoted in the above comment.

15. Page 41, second paragraph: This section states that "There are no known receptors within the impacted area...." This text must be modified or removed, at least until the extent of the impacted area has been determined.

16. Page 55, second paragraph: Note that surface soils are defined in RISC as those in the top six inches of the soil profile.

17. Page 61, Mailing Lists: Does one of the property owners on this list own the railroad right-of-way south of the site? If not, who does?

18. Table 1: This table will need to include cleanup goals for off-site and site boundary areas.

19. Figure 1, Site Location Map: The site is not indicated on the figure.

20. Figure 6, Soil Gas Survey Results – TCE: There are no data plotted on the map to verify the isoconcentrations of TCE in the soil gas. The contours suggest TCE does not extend off-site. Data need to be presented to support this interpretation. The data presented on Figure 9 refutes the APT interpreted contours.

21. Figure 7, Soil Gas Survey Results – 1,1,1-TCA: The comments for Figure 6 also apply to this figure. There are no data points on the map, only contour lines. In consideration of the APT interpretations of other data, the contours require substantiation by data. Again, the data presented on Figure 9 refute the APT contour interpretations.

22. Figure 9, Soil Analytical Results: There are no analytical results showing "non detects" for VOCs in the soil. The vertical extent of contamination in the soil has not been delineated. Hot spot areas are evident. Near the solvent recovery area of building 104, soil borings GB-12, GB-13, and GB-14 had analytical results showing TCE concentrations of 16,000 ppb, 1,900 ppb, and 3,200ppb, respectively, at a depth of 10-11 feet. No other soil samples were taken southeast (down-gradient) of these borings. The south boundary of the property also had detections of TCE ranging from 60-760 ppb. No additional sampling occurred south of these boring locations. The extent of contamination is not known beyond the south property line.

23. Figure 10, TCE Isoconcentration Map – Soil: At least three errors appear to be present in this figure, which according to Note 2 illustrates maximum trichloroethene values observed in each borehole. The highest value in GB-14 was 3,200 ppm, not 3,700 ppm. Likewise, the values for GB-39 and GB-40 should read 75 and 350, respectively. Again, soils require full delineation, and investigation is necessary off-site.

24. Figures 12, 13 and 14 all suggest that the vertical extent of soil contamination may not have been determined. Each of these figures shows that, for the majority of borings,

the deepest samples collected had the highest trichloroethene concentrations in soils. Given that chlorinated solvents are denser than water, additional soils investigation is required below the groundwater surface.

25. Figure 19, TCE Isoconcentration Map – Ground Water: The monitoring well network is inadequate and incomplete to interpret the extent of contamination. This is demonstrated by the detections of TCE in all monitoring wells along the southern and eastern property lines, except the MW-8 location in the southeast corner. Additional investigation is required off-site to determine the extent of ground water contamination.

26. The isoconcentration lines for all mapped contaminants of concern in all media were closed using solid lines on all of the illustrations. The conventional significance of a solid contour line is indicative of hard data to substantiate the interpreted concentration. Reasonable interpretations of the available data require isoconcentration contours to extend off-site, and the contours should be illustrated as dashed lines to indicate inadequate data were available for a conclusive interpretation.

27. Figure 20, Proposed Air Sparge Point and Soil Vapor Extraction Well Locations: Although the proposed remediation is premature, due to the lack of delineating the extent of contamination in the soil and ground water, the method is appropriate for the site conditions and the contaminants of concern.

28. Appendix A, Boring Logs: Numerous boring logs show missing or identical PID/OVM readings. Please elaborate.

29. Have transformers been on site, and have possible PCB impacts been investigated?

If you have any questions, please contact me at (317) 233-2991, (800) 451-6027, or at mhabeck@dem.state.in.us.

Sincerely,

Michael Habeck, Project Manager
Voluntary Remediation Program
Office of Land Quality

Peggy Dorsey, Section Chief
Voluntary Remediation Program
Office of Land Quality

Attachment

37700 Cindi Robertson

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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VIA CERTIFIED MAIL 7000 0600 0027 2035 6071 July 31, 2002

Mr. Marvin E. Gobles, P.E.
Manager-Environmental Services
CTS Corporation
905 West Boulevard North
Elkhart, Indiana 46514

Dear Mr. Gobles:

Re: Amended Closure Plan
CTS Corporation
Plastics Plant
Elkhart Indiana
IND 000806752

The Indiana Department of Environmental Management (IDEM) acknowledges receipt of the Amended Closure Plan (ACP) for the above facility dated June 19, 2002. The ACP was submitted on your behalf by APT, Limited. The ACP is approved with the following modifications.

1. Section 9.0 of the ACP states that "The concrete storage pad in the CSA has not yet been formally decontaminated. At this juncture, CTS anticipates that the concrete pad will be destroyed with off-site disposal." Section 11.1 of the ACP describes the sampling for the CSA site for the determination of horizontal nature and extent of the contamination. The IDEM recommends that the destruction and removal of the concrete pad take place before the CSA site is sampled for nature and extent of contamination.

2. As stated above, Section 9.0 states that CTS anticipates destroying and shipping off-site the concrete pad. If it is determined that the pad will remain in place CTS is to submit decontamination procedures for the pad.